

# Avian Influenza Surveillance and Contingency Plan

Parker River  
National Wildlife Refuge

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# **Parker River National Wildlife Refuge Avian Influenza Surveillance and Disease Contingency Plan**

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## **PARKER RIVER NWR HPAI – DISEASE CONTINGENCY PLAN (DCP)**

### **(1.) BACKGROUND AND INTRODUCTION**

**Background.** Avian influenza (AI) is a nonclinical viral infection of wild birds that is caused by a group of viruses known as type A viruses that are naturally found in certain species of waterfowl and shorebirds. (Note: Influenza viruses are grouped into three types, designated A, B, and C. Influenza A and B viruses are of concern for human health. Only influenza A viruses can cause pandemics [WHO-2006]) Type A viruses are maintained in wild birds by fecal-oral routes of transmission. AI viruses change rapidly in nature by mixing of their genetic components to form slightly different viral subtypes. The virus subtypes are identified and classified on the basis of two broad types of antigens, hemagglutinin (H) and neuraminidases (N). Wild ducks, geese and shorebirds are the natural reservoir for influenza A virus, as all 16 (H) and 9 (N) subtypes are found in these wild birds (Friend and Franson - 1999).

Infection can range from asymptomatic to severe, depending on the virulence of the virus and the susceptibility of the avian host. AI in domestic chickens and turkeys is classified according to disease severity, with two recognized forms: low-pathogenic avian influenza (LPAI) causing only mild symptoms (ruffled feathers or drop in egg production); and highly pathogenic avian influenza (HPAI), also known as fowl plague, which spreads very rapidly through domestic flocks, affects multiple internal organs and reaches mortality rates of 100%, often within 48 hours. The designation of high or low pathogenic avian influenza refers to the potential for these viruses to kill domestic poultry, not how infectious the viruses may be to humans, wild bird or other animals.

**Role of Migratory Birds.** Wild waterfowl and other migratory birds generally do not develop disease when infected with AI viruses. In the past, highly pathogenic viruses have been isolated from migratory birds on very rare occasions. These isolations have involved a few birds, typically found dead within the flight range of a domestic poultry outbreak. This has long suggested that migratory birds were not agents for the onward transmission of AI viruses.

The role of migratory birds in the spread of HPAI is not fully understood. Wild waterfowl are considered the natural reservoir of all influenza A viruses, and have probably carried these viruses, with no apparent harm, for centuries. They are also known to carry viruses of the H5 and H7 subtypes, but in the low pathogenic form. Growing circumstantial evidence suggests that migratory birds can introduce LPAI H5 and H7 viruses to poultry flocks, which then mutate to the highly pathogenic form.

More recently, the rapid spread of H5N1-AI virus to new geographic regions, possibly by migrating waterfowl, has caused concern among public health officials who fear an H5N1 pandemic. An outbreak of H5N1 among migratory geese and other wild birds in Qinghai province, China, was reported in May 2005. Asian AI investigators have shown that asymptotically infected domestic ducks are shedding more H5N1 virus for longer periods of time during 2005 compared to 2004 and 2003, which may be amplifying the spread of H5N1 to domestic poultry and wild birds. By the end of 2005, H5N1 expanded

its geographic range beyond Asia with evidence that H5N1 has been shown to infect migratory waterfowl, making the spread of the virus via migratory wild birds a growing certainty. An example of this was when bar-headed geese and whooper swans died on Erkhel Lake, Mongolia, an area not known to have domestic poultry nearby (US Interagency Strategic Plan [USISP-2006]).

A greater number of HPAI outbreaks reported world-wide has authenticated the tenaciousness of the H5N1 virus. Despite the fact that over 150 million domesticated birds have been killed by the virus or culled to prevent further spread, H5N1 has expanded its geographic range to other continents. To date 12 countries in East Asia, 30 countries in Europe, Siberia and Central Asia and 7 countries in Africa have reported H5N1 infections in poultry and wild birds and the virus is now considered endemic in many parts of the world (CIDRAP-2006, WHO-2006).

The unprecedented rapid spread of subtype Asian H5N1 virus across Asia to Europe and Africa coupled with over 200 human cases of infection confirmed, with more than half of them fatal (WHO-2006) and agricultural losses estimated over \$10 billion, has raised grave concerns if the virus is introduced in the United States. The HPAI strain of H5N1 currently affecting countries in Asia, Africa, Europe and other geographic areas, has never been found in the United States. Other forms of HPAI have been detected in domestic poultry three times in this country: 1924, 1983 and 2004.

Recent events increase the probability that more migratory birds are likely to amplify the H5N1 virus in its highly pathogenic form and its spread to North America is greatly feared. Given the adaptation and continued proliferation of Asian H5N1-HPAI, elevated preoccupations with negative impacts to migratory birds, domestic poultry industry and human health issues continue to grow, should this virus be introduced into the United States. Numerous potential routes for the introduction of this virus into the U. S. include illegal movement of domestic or wild birds through live markets, contaminated products, infected travelers, as a bioterrorism event, and the migration of infected wild, migratory birds. This led to the development of a national, interagency plan to address the early detection and monitoring of a potential introduction of Asian, H5N1-HPAI by migratory birds in all North American Flyways.

With H5N1 becoming a growing concern for wild bird populations in North America and the United States, it has become crucial for USFWS field personnel to be prepared to conduct early detection surveillance and understand our role in state, regional and national preparedness and response planning. This Disease Contingency Plan (DCP) will briefly describe the Resources of Concern (ROCs) specific to Parker River National Wildlife Refuge (PKRNWR), disease surveillance detection activities, HPAI assessment and monitoring, disease outbreak response, data recording conducted on the refuge, and identification of private poultry assets immediately adjacent to PKRNWR, with associated risks and economic consequences should a severe outbreak occur locally on refuge lands.

**Introduction to National Plan Strategies.** The ability to efficiently control the spread of a highly infectious, exotic, viral disease, is dependent upon the capacity to rapidly

detect the pathogen if introduced. The goal of the U.S. Interagency Plan is to describe the essential components of a **unified national system for the early detection of Asian H5N1-HPAI in migratory birds**. Data collected throughout the country in accordance with the plan's guidelines will be assimilated into a national database for use by all local, state, regional and national agencies, organizations, and policy makers.

The data collection system focuses on the detection of H5N1 in wild, migratory birds. Effective implementation of this National Detection System will depend on decentralized planning and execution at regional, state and local levels for success, combined with centralized coordination to ensure national level analysis of surveillance data for rapid risk assessment. A shared central database will increase information critical to the understanding of the ecology of AI viruses and their transmission among wildlife, domestic livestock, and humans. Birds will be sampled whenever possible in conjunction with existing studies. Additional bird captures and sampling for H5N1 will be broadened to provide a wide spectrum of species and more comprehensive geographic surveillance effort.

**Geographic Prioritization of Sampling Efforts.** The National Strategic Plan targets wild bird species that have the highest risk of being exposed to H5N1 because of their migratory movement patterns. Given the current knowledge of highly pathogenic H5N1 avian influenza distribution world-wide, sampling efforts include the following regions in decreasing order of importance:

1. Alaska, the Pacific Flyway, and Oceania\*
2. Central Flyway
3. Mississippi Flyway
4. Atlantic Flyway

\* Oceania defined to include Hawaii, U.S. Pacific Territories & Freely Associated States.

**Sampling Strategies.** To provide a uniform structure for the development of local plans, the National Interagency Strategic Plan recommends the incorporation of five strategies for collecting surveillance data:

1. Investigation of Morbidity/Mortality Events
2. Surveillance in Live Wild Birds
3. Surveillance in Hunter-Killed Birds
4. Sentinel Species
5. Environmental Sampling

**Morbidity/Mortality Events.** Over 40 species of wild birds have been shown to be susceptible to infection of highly pathogenic H5N1 avian influenza virus. There is increasing evidence that H5N1 is killing wild birds which is not the usual characteristic of AI viruses. The systematic investigation of morbidity and mortality events in wild birds and uniform protocol for reporting these events offer the highest and earliest probability of detecting the virus, if it is introduced by migratory birds in the U.S.

National Wildlife Refuges can play a key role in early detection by 1.) rapidly reporting and submitting appropriate biological specimens to qualified diagnostic facilities; 2.) immediately assessing mortality field event(s) (descriptive epidemiology) and reporting

data to the National Wildlife Health Center (NWHC) Field Investigation Team (FIT); and 3.) developing a pre-planned contingency response that is refuge-specific for H5N1-HPAI. Reporting of all mortality events will be made directly to (NWHC), where a centralized database HPAI Early Disease Detection System (HEDDS), which is part of the Wildlife Disease Information Node (WDIN) [USGS National Biological Information Infrastructure (NBII)], will be maintained and made available to contributors.

Designated refuge personnel will immediately respond to mortality events by conducting field investigations to determine the onset, course, duration, distribution, species, and other environmental conditions associated with all wildlife morbidity/mortality. Representative and suitable carcasses and other biological samples and specimens will be submitted to local and national diagnostic facilities listed in this DCP.

National Strategic Plan guidelines will be followed to assure the appropriate number and types of samples are collected to ensure a statistically-based confidence in sample size. Reports of mortality of specified target species will be given the highest priority (See tables with target waterfowl, shorebird and passerine species as potential carriers of highly pathogenic H5N1 avian influenza subtype in North America pages: 23-33 in U. S. Interagency Strategic Plan –[USISP-2006]). If federally endangered or threatened species are involved, single mortalities will be reported.

A wild bird die-off will serve as a “trigger-event” wherever it occurs, that immediately focuses an investigation to a given area and species. Because the current form of H5N1 virus circulating in Asia will be new to North America, the hypothesis is that H5N1-HPAI will be detected if it is the cause of an observed mortality event. Concentrating on recovering carcasses and bio-samples from wild bird die-offs affords a timely opportunity to obtain the greatest amount of information about health and disease in wild birds without an a priori bias.

**Surveillance in Live Wild Birds.** Should H5N1-HPAI be detected in domestic birds locally, sampling of wild birds near the affected area will become a high priority as well. The USISP projected to collect 75,000 to 100,000 samples from live and dead wild birds in 2006.

**Surveillance in Hunter-killed Birds.** Hunter-killed birds provide an opportunity to obtain additional samples and supplement data collected during surveillance of live birds. Greater sampling details are contained within the four Migratory Bird Flyway Council Plans. Details of surveillance strategies for the Atlantic Flyway will be discussed in Section 2 of the DCP.

**Sentinel Species.** Placement of sentinel ducks has been used successfully for surveillance of influenza A in the poultry industry and in wild bird colonies where improved virus detection rates increased fivefold (USISP-2006). Duck flocks can be placed in wetland habitats where they intermingle with wild birds, and then they are monitored and tested for AI viruses.

**Environmental Sampling.** AI viruses are released by waterfowl through the intestinal tract and viable virus can be detected in both feces and the water where birds swim and

feed. This is the principal means of virus spread to new avian hosts and to poultry and other livestock. Water analysis can provide evidence of AI virus circulating in wild bird populations, levels of pathogenicity, and risk factors to domestic livestock.

Monitoring of water and/or fecal samples gathered from waterfowl habitats is a reasonably cost effective and technologically achievable means to assess risk to poultry. Either approach yields advantages where individual bird sampling is too costly or logistically impractical. USDA and DOI agencies plan to collect 50,000 samples from high-risk waterfowl habitats across the United States in 2006.

#### **(a.) REFUGE DESCRIPTION AND PURPOSES**

Parker River National Wildlife Refuge was established in 1942 for the purposes of: “... use as an inviolate sanctuary, or for any other management purpose, for migratory birds” (Migratory Bird Conservation Act 1929). The 4,662-acre refuge occupies the southern two-thirds of Plum Island, a 9-mile long barrier island. The State of Massachusetts manages the most southern tip of the island as the Sandy Point State Reservation, with public access through the Refuge. The Refuge is a vital stopover site along the Atlantic Flyway for waterfowl, shorebirds, and songbirds. The Refuge’s diverse upland and wetland habitats support hundreds of plant and animal species, particularly breeding piping plover and wintering black duck.

#### **(b.) NATIVE HABITATS IMPORTANT FOR THE MAINTENANCE OF BIOLOGICAL INTEGRITY**

The Refuge hosts many exemplary natural communities of barrier island ecosystems, including 182 acres of tidal beach, 540 acres of maritime dunes, 333 acres of maritime shrub and forest, 2,660 acres of salt marsh habitat, 1,237 acres of tidal river, estuary and associated mudflats. Rare and exemplary natural communities (S1, typically 5 or fewer occurrences, very few remaining acres, or especially vulnerable to extirpation), as identified by the Massachusetts Natural heritage and Endangered Species Program include sandplain grassland, pitch pine dunes, interdunal swales, and brackish tidal marsh (MA NHESP 2001). The ecological processes (e.g., salt spray, storm surges) that maintain these coastal communities are largely intact on Plum Island, ensuring the long-term survival and ecological integrity of these coastal communities. Invasive plants are a threat to maintaining the biological integrity of these communities, particularly the maritime shrub and forest, interdunal swale, pitch pine, and sandplain grassland communities.

#### **(c.) SERVICE TRUST RESOURCES WHICH ARE A PRIORITY FOR REFUGE MANAGEMENT**

Service trust resources which are a priority for PKRNWR management include migratory birds, endangered species (both state and federally listed), and interjurisdictional fish. The refuge plays a very significant role in the state of Massachusetts and the Atlantic Flyway for landbird, waterfowl and shorebird conservation.

##### **i. Migratory Birds.**



### **Waterfowl.**

Thirty-four waterfowl species use the habitats at Parker River. High priority species identified within Bird Conservation Region (BCR) 30 include American black duck, Atlantic brant, Canada goose, black scoter, bufflehead, common eider, greater scaup, lesser scaup, hooded merganser, long-tailed duck, mallard, surf scoter, and white-winged scoter. The Refuge manages the three man-made impoundments to benefit breeding and migrating waterfowl. The salt marsh and associated estuaries also provide migration and wintering habitat for waterfowl. Parker River hosts one of the highest concentrations of wintering American black ducks on the east coasts, with high daily counts of 3,000 black ducks. The marine waters adjacent to the Refuge are important wintering areas for sea ducks.

### **Shorebird and Wading Birds**

Parker River Refuge and the surround Great Marsh was recently designated as a Western Hemisphere Shorebird Reserve Network (WHSRN) site. The Refuge provides habitat for 75 species of shorebirds, gulls, and wading birds. High priority species in BCR 30 include American oystercatcher, American golden plover, American woodcock, black-bellied plover, buff-breasted sandpiper, dunlin, greater yellowlegs, Hudsonian godwit, marbled godwit, piping plover, purple sandpiper, red-necked phalarope, red knot, ruddy turnstone, sanderling, semipalmated sandpiper, short-billed dowitcher, solitary sandpiper, whimbrel, white-rumped sandpiper, willet, black rail, Wilson's plover, American bittern, lester tern, little blue heron, red-throated loon, roseate tern, and snowy egret. The Bill Forward and Stage Island Impoundments are actively managed to benefit migrating shorebirds. The North Pool is managed to benefit breeding marsh and wading birds.

### **Landbird**

The Refuge's maritime shrubland and forest are important habitat to breeding and migrating landbirds. Over 150 species of songbirds use shrub habitats on the Refuge. The fruit-bearing plants in shrubland habitats provide a vital stopover to migrating songbirds, particularly young birds, which make up roughly 90 percent of migrants during the fall migrations. High priority landbird using the Refuge include Baltimore oriole, black-and-white warbler, blue-winged warbler, broad-winged hawk, brown thrasher, eastern kingbird, eastern towhee, field sparrow, great-crested flycatcher, Louisiana waterthrush, marsh wren, prairie warbler, scarlet tanager, willow flycatcher, woodthrush, and whip-poor-will.

The salt marsh at Parker River provides important breeding habitat for several species of salt marsh sparrows, all top priority species for management in BCR 30. These include seaside sparrow, Nelson's sharp-tailed sparrow, and salt marsh sharp-tailed sparrow.

### **ii. Endangered and Threatened Species**

Conservation and recovery of the federally listed piping plover is a high priority for management at Parker River Refuge. The Refuge closes its 6.3-mile beach to enhance productivity of plovers during the nesting season. Additionally, staff

manages plovers nesting on State-owned beach at the north and south end of Plum Island. Other federally listed species that seasonally use the Refuge include bald eagle, roseate tern, short-nosed sturgeon, and red knot (candidate species).

State-listed species that breed on the Refuge include least terns, pied-billed grebe (E), American bittern (E), least bittern (E), Northern Harrier (T), king rail (T), common moorhen (SC), sedge wren (E), eastern spadefoot toad (T), and threespine stickleback (T). The Refuge also hosts several state-listed plants, including seabeach needlegrass (*Aristida tuberculosa*) and dragon's mouth (*Arethusa bulbosa*, historical record).

### **iii. Interjurisdictional Fishes.**

The estuarine habitats of the Refuge provide habitat for a diverse array for fish and shellfish species. Survey data indicate that 45 species of finfish utilize the Refuge salt marsh and adjacent Plum Island Sound. Interjurisdictional fish include Alewife, blueback herring, American smelt, Atlantic sturgeon, shad, striped bass, and American eel (petitioned for Federal listing).

## **(d.) SEASONAL WEATHER CONDITIONS**

The weather of Plum Island is generally more moderate than that of just a few miles inland. The prevailing winds are from the west, at an average velocity of 10-13 miles per hour. The average temperature in Boston ranges from a low in January of 28.2 degrees F. to a high of 72.0 degrees F. in July. Average precipitation is 44.4 inches annually, with November and December receiving the most precipitation. Seasonal extreme high tides affect the refuge periodically. Hurricanes and Nor'easter storms can abruptly alter refuge habitats and physical features.

## **(e.) REFUGE WILDLIFE DISEASE HISTORY**

In the late 1980's over 100 dead Canada geese were collected on the Refuge, primarily around the Stage Island Pool area. They were sent to the NWHC in Madison, WI. The suspected cause of death was lead poisoning. Soil surveys revealed that lead shot presence was significant. The Stage Island Pool was drained and the area containing the lead shot was plowed using a Dozer pulling a double bottom plow. The soil was turned upside down to a depth of 12 inches. This took place over the next two years and was completed in 1991. The plowing under of the lead shot at Stage Island was successful in preventing any further lead poisoning.

When the red fox populations approach carrying capacity outbreaks of sarcoptic mange are likely, however with the recent influx of coyotes, red fox populations have lessened. The spread of rabies transmitted by raccoons reached Massachusetts in the early 1990's. Several rabid raccoons were reported in nearby towns.

There are no cases of any avian disease outbreaks known to have occurred at Parker River NWR.

## **(f.) AVIAN ECOLOGY AND MANAGEMENT**

Parker River Refuge is noted as one of the best birding spots in the country with more than 350 species recorded. A diversity of bird species visit the Refuge year-round, many

are of conservation concern. In addition to managing for breeding piping plover, least tern, and common tern, the Refuge actively manages three man-made impoundments to benefit breeding and migration waterfowl, shorebirds, and wading birds. Impoundment management has evolved since their creation. Historically, they were managed to provide breeding habitat for waterfowl, with intense mowing, disking, seeding, and water-level management. Since the 1990s, we've managed the impoundments to provide migration habitat for shorebirds and waterfowl through water-level management and invasive plant control. Due to the inability to manage water level in the North Pool, that impoundment is currently managed to provide habitat for breeding waterfowl and marsh and wading birds. Parker River Refuge manages eight grassland units to benefit grassland breeding birds, mainly bobolink, meadowlark, and savannah sparrow.

Other habitats on the Refuge provide valuable habitat for avian species, but do not require active management. The sandy beach provides breeding habitat for piping plovers and least terns, as well as migratory habitat for shorebirds. The dunes support migrating raptors and wintering habitat for Ipswich Savannah sparrow. The maritime shrubs and forest provide breeding and migration habitat for numerous species of songbirds and raptors. The salt marsh habitat provides important breeding habitat for common terns, willets, and saltmarsh sparrows; migratory and foraging habitat for numerous species of waterfowl, shorebirds, and wading birds; and wintering habitat for waterfowl, particularly the American black duck. Through various salt marsh restoration projects, including Open Marsh Water Management, the Refuge is attempting to restore hydrology and improve habitat for avian species.

#### **(g.) DESCRIPTION OF KNOWN RISK FACTORS FOR H5N1-HPAI ADJACENT TO PARKER RIVER NATIONAL WILDLIFE REFUGE**

The following information was taken from the Massachusetts Department of Agriculture and the Merrimack Valley Economic Development Council, Inc.

Nearly five percent of the state's farmland is located in Essex County, totaling 25,547 acres on 396 farms. Of the major farms reported in the Merrimack valley (29 ) only one indicated poultry production. That is Tendercrop Farms in Newbury, MA which raises turkeys for its retail business. Tendercrop Farms is located approximately half a mile from the Refuge Headquarters in the Town of Newbury.

In the Town of Essex, approximately 5 miles to the southeast of Plum Island, is an egg farm (Hardy Hatchery).

To the west of the Refuge are three state Wildlife Management Areas that support migratory waterfowl.

The following safe guards are in place and promulgated by the Commonwealth of Massachusetts, Bureau of Animal Health regarding Biosecurity for Poultry Exhibitors & Exhibitions:

All poultry exhibitors and managers of poultry exhibitions are advised to take precautions to protect flocks against two serious poultry diseases.

**Low Pathogenic Avian Influenza** (LPAI), is a respiratory disease of poultry, turkeys, gamebirds and waterfowl. Symptoms of low pathogenic AI are typically mild and in many cases not present. The disease, however, can manifest itself through depression, decreased food consumption, respiratory signs (coughing and sneezing), and a decrease in egg production.

**Exotic Newcastle Disease** (END), is an acute rapid-spreading contagious respiratory disease of all birds. END is a virus, it is characterized by respiratory distress (gasping), or diarrhea, or encephalitis (brain infection). Birds can die so rapidly that you may not see these signs. END is highly fatal to young chicks and it causes a severe drop in egg production. .

The USDA Animal and Plant Health Inspection Services (APHIS), has established a surveillance program for AI/END. Diagnostic services are available through this program at no cost to the flock owner.

Flocks experiencing sudden mortality, respiratory symptoms, or swollen heads should contact the Department as soon as possible for assistance in submittal of these birds to the laboratory for necropsy at 617-626- 1795.

Outbreaks of Avian Influenza and Exotic Newcastle disease highlight the importance of increased biosecurity on farms and at exhibitions. The following biosecurity measures should be followed:

- Exhibitors and show superintendents should evaluate the security on their premises.
- All poultry should be inspected, at least, daily to insure they are in good health.
- Only clean shaving, cages, feeders and waters should be used at exhibition.
- Birds should only be purchased from National Poultry Improvement Plan (NPIP) approved flocks.
- Only birds which are currently certified Salmonella Pullorum clean and approved by NPIP may move to exhibition in Massachusetts.
- All birds entering or reentering the exhibitors flock should be isolated from the main flock for a minimum of 10 days.
- Any clothes and footwear, which were worn at the exhibition should be cleaned and washed before you enter your flock.
- All bird carriers should be cleaned of manure and other organics. The carriers should then be disinfected prior to contact with the flock, a solution of 10% bleach and water should be adequate.

Any time poultry is commingled there is a potential for disease spread. It is your responsibility to apply protections and good management practices which will minimize your risk.

**(h.) REFUGE PUBLIC USE PROGRAMS THAT WOULD DISTURB  
MIGRATORY BIRDS OR RESULT IN CONTACT WITH INFECTED  
MATERIALS (dead birds, fecal material or contaminated water) DURING AN  
HPAI VIRUS OUTBREAK**

- i. The deer hunt and youth waterfowl hunt on Plum Island would disturb migratory birds.
- ii. Waterfowl Hunting in Areas A, B, and C would disturb migratory birds and results in contact with infected material(s).
- iii. Research Studies (R3/R5) activities can result in contact with infected materials in wetland habitats.
- iv. Public Use areas at the Refuge Impoundments would disturb migratory birds and may result in contact with infected materials.
- v. Environmental Educational activities where non-destructive sampling of refuge wetland areas can result in contact with infected disease materials.

- vi. Public Use at Sandy Point State Reservation (south end of Plum Island) would disturb migratory birds and may result in contact with infected material(s).

Should an HPAI disease outbreak occur on the refuge, all public use can be restricted or eliminated on PKRNWR until such time as local, regional, and national public health authorities deem it is safe, and disease outbreak conditions are fully contained. The Refuge will also have to coordinate with Massachusetts DNR regarding the closure of the Sandy Point State Reservation at the south end of the Refuge on Plum Island. If the refuge has to be closed temporarily, law enforcement will be utilized to prevent public use and access to refuge lands when necessary.

## **2. PERSONAL PROTECTION EQUIPMENT (PPE), WORK PRACTICES, BIOCONTAINMENT AND SANITATION**

### **(a.) EMPLOYEE SAFETY AND PPE**

Viral transmissions from wild waterfowl to humans in North America have not been documented. A recent study is the first to assess hunters and wildlife professionals with substantial exposures to wild ducks and geese, known natural reservoirs of influenza A in nature. Sampling data revealed that in late August and early September (when most duck banding occurs) and in late September (when duck hunting begins), a significant proportion of hatch year mallards (65%) and other duck species were infected with influenza A virus. Later in the fall and winter, as duck migration progressed, a decrease of influenza A infection prevalence was noted.

Although the worker sample size was small, evidence suggests that handling wild waterfowl, especially ducks in late summer, is definitely a risk factor for the direct transmission of AI virus to humans. Study participants had several years exposure to wild birds infected with AI through duck banding and hunting, and never wore PPE. Researchers and CDC scientists strongly recommend the use of gloves, masks and eye protection should be worn when handling wild waterfowl, even when disease risk is low.

**i. Field Personnel Safety.** Given the infectious concerns for the introduction of highly pathogenic H5N1 avian influenza into North America, significant precautions should be taken by field workers conducting any environmental sampling and all employees handling any live or dead birds. In the field workers should always wear boots, coveralls, latex gloves; and have with them disinfectant, bucket, water and brush as basic minimums for in situ decontamination of work surfaces and PPE. Gloves should be decontaminated with 70 % ethanol frequently, or changed as often as necessary. Mucous membranes (eyes, nose throat) should be protected from splashes and aerosols. Field workers should avoid contact with animals after handling environmental samples until complete decontamination procedures have been completed (e.g., changing coveralls, gloves, removing boots, etc.). Untrained workers (general public) should be discouraged from collecting dead birds and/or submitting environmental samples for AI testing, see attachment 2.

PPE required during surveillance and response activities will be based on the level of risk reflected by field conditions and work activities that result in varying degrees of potential exposure to disease. Attachment 1 (**Employee Safety and Health for Avian Influenza Surveillance and Control Activities**) of this DCP contains a reference work table describing required PPE and specific work practices for different disease response activities and their related degrees of risk (conditions) associated with HPAI exposure and suggested antiviral meds indicated for each task, where appropriate. These precautions are based on protecting individuals involved in the response to an H5N1-HPAI outbreak and the risk of viral reassortment (mixing of genes from humans and avian viruses).

**(Case Scenario # 1).** In an area where highly pathogenic H5N1 avian influenza **has not been detected**, field workers should follow the recommendations provided in the NWHC Guidelines for Handling Wild Birds (See References cited). PPE for handling live or dead birds should include rubber boots, coveralls and latex or rubber gloves that can be disinfected or discarded. In addition, the use of goggles NIOSH N 95 masks are **highly recommended**.

**(Case Scenario # 2).** In areas where highly pathogenic H5N1 avian influenza **has been detected**, PPE should include complete coveralls, rubber or latex gloves, and boot covers that are disposable or boots that can be disinfected. Minimize exposure to mucosal membranes by wearing protective eyewear and a particulate surgical mask (mandatory), as well as having a personal health monitoring plan are all required. Greater details for PPE requirements during an HPAI disease outbreak is described in Section 4a of this DCP.

**ii. Worker Health Monitoring.** Unvaccinated workers who come into direct contact with H5N1 infected wild birds or contaminated wildland environments should receive an influenza antiviral drug daily. The choice of antiviral medicine should be based on sensitivity testing when possible. In the absence of sensitivity testing, a oseltamavir (Tamiflu<sup>TM</sup>) is the first choice as the likelihood is smaller that H5N1 virus will be resistant to this class of antiviral drug compared to amantadine or rimantadine (CDC – AI Health Guidelines-2006).

**iii. Medical Evaluations** are recommended for all exposed employees and should include post-exposure prophylaxis (PEP) with antiviral drugs. Vigilance for any development of fever, respiratory symptoms, and/or conjunctivitis (eye infections) for one week after the last exposure to H5N1-HPAI is essential. This post-exposure monitoring is very important. Employees should contact their healthcare provider immediately if fever, any flu-like symptoms or conjunctivitis develop. Inform doctors prior to arrival that you have potentially been exposed to HPAI.

## **(b.) BIOCONTAINMENT**

The ability to successfully execute disease control operations during large disease outbreaks is highly dependent on the **readiness** of refuge field personnel to deal with them. The first rule of biocontainment is **prevent the spread of any infectious disease to new locations**. The second rule is **use minimum personnel necessary to accomplish**

**the investigation.** All disease outbreaks consist of three main components: (1.) a susceptible host population; (2.) a disease agent interface; and (3.) the environment in which the host and agent interact in a manner that propagates and spreads disease. Successful wildlife disease control involves breaking the connections between these factors (Friend and Franson 1999).

**i. Refuge Biological Records.** The refuge-specific information about avian distribution and migrational patterns, seasonal migratory bird use of PKRNWR, environmental features and habitat management practices plus the history of refuge disease problems contained in Section 1, will provide biological profile data for rapid risk assessment and a basis for more specific disease control actions. A historical overview of past disease problems that have occurred on PKRNWR and environs, locations, date of occurrences, the species and the general magnitude of losses are summarized in the table below.

**Biocontainment Response Activities.** Timely and properly carried out disease control activities (early detection, rapid assessment and prompt submission of specimens to qualified disease diagnostic facilities) can significantly reduce the magnitude of wildlife losses and reduce risk factors. When carrying out all control activities, the safety of all involved personnel will be the utmost consideration.

Parker River's biocontainment strategy will encompass the following five elements :

1.) identification of various work areas needed for disease control activities to include command post location, assembly areas for arriving workers, vehicle parking, briefing areas for news media and staff, laboratory investigations and carcass disposal areas; 2.) equipment and supplies necessary for biocontainment; 3.) carcass collection and disposal; 4.) sanitation procedures; and 5.) data recording and reporting. The refuge's initial biocontainment response to an H5N1-HPAI outbreak will first establish immediate control of the affected area. Then, depending on the size and severity of the outbreak, PKRNWR will close off all required areas to assure biosecurity and limit access to all but authorized personnel.

**ii. Designated PKRNWR Work Areas To be Used in Response to an H5N1-HPAI Mortality Event.** Three designated zones with various work areas have been delineated to be used for H5N1-HPAI virus control operations on PKRNWR: 1) Clean Zone; 2) Transition Zone; and 3) Contamination Zone (See Figure 1 in Appendix 1).

(1.) CLEAN AREA = Refuge Headquarters and Visitor Center Building

- a.) **Command Post** = Headquarters Auditorium
- b.) **Briefing Room** = Same Location as Command Post
- c.) **Parking** = Two areas surrounding Refuge Headquarters Building
- d.) **Eating Area:** Refuge Staff Kitchen Area
- e.) **HPAI Workers Rest Area** = Auditorium & Kitchen Area
- f.) **Equipment and Supply Receiving Area** = Shop, adjacent to Refuge Headquarters.

(2.) TRANSITION AREA = Visitor Contact Station at lot 1

- a.) Decontamination of personnel leaving contaminated areas before leaving Refuge.
- b.) Decontamination of all equipment (both PPE and heavy equipment) leaving any contaminated areas on Refuge.

(3.) CONTAMINATED AREAS = Sub-Headquarters

- a.) **Carcass Disposal Area:** Staging of vehicles and personnel that have collected dead birds on refuge only. Sub-headquarters will serve as the “Carcass Removal” rendezvous area to transport carcasses to state designated “biocontainment disposal sites” or for burial. Coordination with Massachusetts Bureau of Animal Health, the Department of Environmental Protection (DEP) and Mass Wildlife, will take place for all carcass removal activities conducted on the refuge.
- b.) **Sub-headquarters:** Will serve as the Field Laboratory to prepare all biological and environmental samples for processing, shipping, and data recording; and preparation of carcasses, for shipment to designated diagnostic labs and associated data collection. Activities at this site will be documented to fulfill all reporting requirement(s) identified in this CDP.

**iii. Protocols identifying authorized H5N1-HPAI viral disease response personnel and established ingress/egress points of access to PKRNWR during disease episodes or mortality events.**

**(c.) Sanitation Practices and Equipment**

**Personnel.** All H5N1-HPAI response workers need to wear outer garments that provide a protective barrier against direct contact with disease organisms, that can be disinfected and removed, before personnel leave a contamination and/or transition zone. These will include boots, coveralls or raingear, gloves and a head covering. All PPE should be destroyed, if disposal, or double-bagged before they are transported to a location where they are to be washed before reuse. When traveling between areas, wash hands often, disinfect all work surfaces and small equipment between sites, and properly dispose of potentially infectious materials and carcasses.

Disinfection procedures will require a stable disinfectant, containers for that disinfecting agent for dilution purposes, and a way of applying the disinfectant. When a disease problem involving an identified infectious agent occurs, personnel handling contaminated materials should refrain from working with similar bird species or other animals susceptible to the disease for at least seven days following completion of their disease control work assignments.

**Carcass Removal/Disposal.** Wildlife mortality from disease serves as major agents that amplify disease-spread in the environment. Carcasses need to be removed from the environment to prevent further disease transmission to other animals. Disease organisms released from tissues and body fluids as carcasses decompose will also contaminate the



environment. Disease-causing viruses and bacteria can survive for several weeks or longer in pond, water, mud and soil.

Because carcass collection concentrates diseased material in a small area, great care is needed to prevent mechanical movement of a disease agent from one area to another or jeopardize the health of personnel. Carcass removal from mortality sites on refuge will require heavy duty plastic bags and containers or both. Plastic garbage cans lined with heavy-gauge leaf bags are excellent choices with strapping tape or bungee straps for secure closure of containers should be used to ensure safe transportation of carcasses from one work area to another.

Carcass disposal will require proper training and supervision. Incineration, burying, rendering, and composting are the four basic disposal methods often used in disease outbreak events. Incineration is the preferred method for disposing of carcasses and contaminated materials. In Massachusetts, air-quality standards often preclude open burning, even for disease emergencies. Burn permits are obtained through the local Fire Departments. Any additional permission will be sought through the States DEP.

PKRNWR will be working very closely with Mass Wildlife and DEP in coordinating and working together on all carcass disposal activities on the refuge or at specially designated sites off Refuge.

### **(3.) DISEASE SURVEILLANCE**

#### **(a.) History of Parker River NWR H5N1-HPAI Disease Surveillance**

Staff monitors the Refuge's bird populations for signs of disease through routine bird surveys. Suspected diseased birds, suspicious deaths (three or more dead birds at one location), and sick or dying species of concern (e.g. dead plover), are submitted to the USGS National Wildlife Health Center in Madison, Wisconsin for diagnosis. No H5N1-HPAI disease surveillance has been conducted on the Refuge to date.

#### **(b.) HPAI – Surveillance (Atlantic Flyway and Massachusetts Plans)**

The goal of the Atlantic Flyway sampling strategy is **early detection** of Asian H5N1 and not to assess its prevalence over time, monitor its rate of movement, or investigate the ecology of the disease. The objectives of this AI detection plan are:

(1) prioritize migratory bird species to be sampled for Asian H5N1 based on direct population connections to Asian and European migrants (e.g., in Alaska and northern Canada), and migration patterns to wintering areas; (2) recommend a suite of sampling approaches to effectively establish an Asian H5N1 detection system in the Atlantic Flyway; (3) describe current resources and opportunities to sample live and hunter-harvested migratory birds; and (4) recommend procedures to integrate detection efforts in the Atlantic Flyway.

Massachusetts Division of Fisheries and Wildlife (MassWildlife) is the lead agency responsible for monitoring wild bird populations for the H5N1 avian influenza. In 2006, MassWildlife sampled 400 waterfowl and other migratory birds (primarily resident Canada goose, mallards, long-tailed ducks and common eider) from different parts of the state. MassWildlife has also set up a hotline (413-253-2403) for reporting of avian flu-

related bird mortalities (three or more sick, dying, or recently dead waterfowl, shorebird, or other waterbirds). In addition to surveillance of wild bird populations, Massachusetts Department of Agricultural Resources has been screening domestic poultry for the avian flu since 1983. To date, the H5N1 virus has not been found in Massachusetts or the Atlantic Flyway.

#### **i. Species Prioritization and Sampling Intensity.**

The Atlantic Flyway list of surveillance candidate species reflects both “primary” species that could come directly in contact with habitats in Asia or Europe, and “secondary” species that would likely intermingle with Asian/European migrants that could be subjected to secondary transmission. Tertiary species do not intermingle directly with Asian/European migrants but do mix with secondary species during migration or on wintering grounds. Tertiary species that are more cosmopolitan could serve as sentinels should Asian H5N1 arrive via poultry imports, the pet trade, or other means through US/Canada ports. Primary and secondary candidate species for early H5N1 virus detection that use the Parker River Refuge during the spring and fall migrations include:

<b><u>Primary:</u></b>	Northern Pintail Tundra Swan Greater Scaup Red Knot
<b><u>Secondary:</u></b>	Greater Snow Goose AP/NAP – Canada Goose Least Sandpiper Western Sandpiper Greater Yellowlegs Black-bellied Plover Canvasback
<b><u>Tertiary:</u></b>	Mallard American Widgeon Wood Duck American Black Duck Resident Canada Goose Semi-palmated sandpiper Sanderling Dunlin Cormorant Common Tern Common Loon

The US Interagency Strategic Plan suggests that a **minimum** of 200 samples would be required to detect one positive Asian H5N1 sample in a defined population with greater than 1,000 individuals (p-95%) if the virus had a prevalence of 1.5%. “Populations of interest” have been established in the Atlantic Flyway Plan, where priority species have been identified for live bird/hunter-harvested bird surveillance sampling in Massachusetts. States will work together to ensure minimum sample sizes of 200 for

each priority species throughout the flyway. For Massachusetts, these species are listed below: (Davies et al 2006)

Long-tailed Duck (LTDU)	75 individuals
Common Eider (COEI)	75 individuals

Massachusetts also has targets for tertiary species. These include:

Wild Mallard (MALL)	25 individuals
Canada Goose–resident (CAGO)	200 individuals

**Sampling Live Birds.** Routine waterfowl and shorebird banding programs provide access to large numbers of waterbirds. The majority of waterfowl banding occurs during the post-breeding molt period. Most of these birds are produced locally and have a low potential of contact with Asian H5N1. However, locally produced birds can act as wild sentinel birds to detect the arrival of Asian H5N1 virus on the east coast based on findings that (1) mallards and pintails are known reservoirs of LPAI viruses with higher prevalence rates than other species; (2) juvenile ducks have the highest prevalence of LPAI among North American surveys; (3) the rate of virus shedding is high during late summer and early migration staging. Therefore sampling for early detection monitoring of HPAI should include samples of local mallards and other locally produced waterfowl during pre-season banding (Davies et al. 2006).

**Sampling Hunter-Harvested Birds.** If Asian H5N1 is carried by wild birds to North America from Alaska and northern Canada, it is likely to move south with 150,000 swans, one million geese, and 12 million ducks to all 4 flyways beginning in August. A detection network in the Atlantic Flyway of sufficient coverage to detect H5N1 infected birds will include a small number of Asian/Eurasian migrants, secondarily infected birds and locally produced birds that have the potential to acquire the virus.

Hunters within the Atlantic Flyway currently harvest 2.4 million ducks, 700,000 geese and 2,400 tundra swans. This presents an opportunity to access and sample a large number of harvested birds in 2006 and beyond. The sampling regime outlined in the Atlantic Flyway plan is designed to test both migratory waterfowl from the far north, as well as a sample of local mallards (Davies et al-2006).

**Environmental Sampling, Methodologies and Training.** The USDA is in charge of developing a program for sampling water and soil, and other environmental materials as part of the national surveillance system. Basic protocols for taking and handling AI samples have been developed in cooperation with USGS, NWHC and USDA. The USIS plan includes procedures and protocols for shipping carcasses (Attachment 3), taking tracheal or cloacal swabs, and collecting and shipping fecal samples.

Samples needed for full analysis (molecular PCR testing and virus isolation will require samples to be chilled, frozen, and stored at super-cold temperatures. Acquisition of high-value samples should be done by trained personnel and will involve special shipping and handling (e.g., transport media, nitrogen shippers, etc.). Given that there will be a substantial investment of resources to implement Asian H5N1 surveillance in the Atlantic

Flyway, and that quality control of sample collection, there is a need for training Service response personnel and collaborative planning with state cooperators.

All refuge staff involved in AI response activities will take a three hour interactive DVD training for “**Early Detection Surveillance for Avian Influenza: What USFWS Field Staff Need to Know.**” DVD acquisition available from Karene Motivans/USFWS/NCTC Office: Branch of Conservation Science and Policy. Phone (304) 876-7458.

The USGS-NWHC provided training on all avian diseases, including avian influenza, to USFWS personnel in October of 2006 at Parker River Refuge. The Refuge Manager and Biologist attended the workshop.

#### **(4.) DISEASE OUTBREAK RESPONSE**

##### **(a.) Service HPAI Risk Assessment Levels of Management.**

The National Service HPAI Response Plan will serve as the refuge’s guidance to H5N1 disease outbreak response actions. PPE required during all surveillance and other response activities will be based on the HPAI National Draft Plan risk assessment levels of management in the table below. Acceptance of a determined low level of risk management will require a site-specific “disease situation assessment” be done at each station, and a minimum identified in writing by the project leader. Higher levels of risk will require the project leader to make that determination followed by concurrence at a higher administrative level as delineated in the table below.

<b>RISK CRITERIA</b>	<b>RISK LEVEL</b>	<b>USFWS Approval Authority</b>
<b>HPAI not suspected or unlikely</b>	<b>1 = Low Risk</b>	<b>PROJECT LEADER</b>
<b>HPAI suspected in sick or dead birds</b>	<b>2 = Medium Risk</b>	<b>Assistant Regional Director</b>
<b>HPAI confirmed in birds</b>	<b>3 = High Risk</b>	<b>Deputy Regional Director</b>
<b>HPAI confirmed in humans</b>	<b>4 = Extremely High Risk</b>	<b>Regional Director</b>

The National Response Plan requires the Director to develop a “Crisis Management Team” that specifically focuses on the human element and risk to Service employees. The team’s task is to define roles and responsibilities for preparedness and response planning if and when pandemic portions of outbreak have occurred. These tasks will include identifying essential services and personnel in the event of a pandemic, and review protocols and current CDC and epidemiology guidance. Project leaders have the responsibility to discuss with field personnel the current site-specific HPAI-H5N1 risk assessment conditions and ensure employees are trained in the use of appropriate PPE.

##### **(b.) Preliminary Refuge Communication Plan**

All wild bird mortality that occurs on the refuge will be immediately reported to NWHC Field Investigation Team (FIT) Leader for the East Coast, Grace McLaughlin (608) 270-2446. Call (608) 270-2400 to leave a message outside of NWHC business hours: (8:00 am-4:30 pm CST). The NWHC will provide immediate technical advice, support and disease information to facilitate refuge decisions affecting wildlife and ecosystem health (USGS-Wildlife Health Bulletin 06-02).

The NWHC is the best resource available to the refuge for consultation regarding any wildlife mortality events and other wildlife disease and health concerns. With regard to surveillance for H5N1-HPAI viral outbreaks, the NWHC will provide direction on collection, preservation, and shipment and advice on the number of carcasses needed for necropsy. A specialized H5N1 NWHC team would also conduct on-site refuge investigations as appropriate.

**Criteria triggering immediate Refuge Field Response to Wild Bird Mortality.**

The following circumstances based on the Delaware response plan will receive priority attention on the refuge:

- Waterfowl, shorebirds or migratory gulls – 5 or more dead on refuge.
- Tundra or mute swans, eagles and other raptors: one or more dead.

The first response objective will be to secure the mortality site on refuge and obtain fresh specimens for NWHC-FIT testing. If test results show HPAI in birds, then further consultation with NWHC staff veterinarians and USFWS AI response staff will determine if an immediate formal disease investigation is warranted. Worst case scenario will result in deployment and mobilization of an NWHC investigation team on site with USDA and Delaware AI State Task Force providing professional support.

H5N1-HPAI communication will follow DOI-US Interagency strategic plan, USFWS national and state of Massachusetts communication plans when they are finalized. As a bare minimum the following contacts will be included in PKRNWR's final DCP communication plan

**Parker River NWR Communication Plan: Key Refuge Contacts to Report HPAI Suspected or Confirmed Outbreaks:**

**NWHC – Dr. Grace McLaughlin – USGS Disease Specialist**  
**(608) 270-2446**      [gmclaughlin@usgs.gov](mailto:gmclaughlin@usgs.gov)

<b>USFWS</b>				
Region 5	Jan Taylor	Regional Biologist	603-431-5581	<a href="mailto:Jan_Taylor@fws.gov">Jan_Taylor@fws.gov</a>
Region 5	Sherry Morgan	ARD Migratory Birds	413-253-8610	<a href="mailto:Sherry_Morgan@fws.gov">Sherry_Morgan@fws.gov</a>
Region 5	Tony Leger	Regional Chief NWRS	413-253-8550	<a href="mailto:Tony_Leger@fws.gov">Tony_Leger@fws.gov</a>
Region 5	Janet Kennedy	Refuge Supervisor	413-253-8553	<a href="mailto:Janet_Kennedy@fws.gov">Janet_Kennedy@fws.gov</a>
Region 5	Diana Weaver	Chief, Public Affairs	413-253-8329	<a href="mailto:Diana_Weaver@fws.gov">Diana_Weaver@fws.gov</a>

Region 5	John Guiel	Safety manager	413-253-8311	<a href="mailto:John_Guiel@fws.gov">John_Guiel@fws.gov</a>
Region 6	Dr. Tom Roffe	Regional Biologist	406-994-5789	<a href="mailto:Thomas_Roffe@fws.gov">Thomas_Roffe@fws.gov</a>
Parker River NWR	Graham Taylor	Project Leader	978-465-5753 x 201	<a href="mailto:Graham_Taylor@fws.gov">Graham_Taylor@fws.gov</a>
Parker River NWR	Frank Drauszewski	Deputy Refuge Manager	978-465-5753 x 204	<a href="mailto:Frank_Drauszewski@fws.gov">Frank_Drauszewski@fws.gov</a>
Parker River NWR	Nancy Pau	Wildlife Biologist	978-465-5753 x 211	<a href="mailto:Nancy_Pau@fws.gov">Nancy_Pau@fws.gov</a>
Parker River NWR	Christopher Husgen	Refuge LE	978-465-5753 x 205	<a href="mailto:Christopher_Husgen@fws.gov">Christopher_Husgen@fws.gov</a>
Parker River NWR	Mark Kerr	Refuge LE	978-465-5753 x 206	<a href="mailto:Mark_Kerr@fws.gov">Mark_Kerr@fws.gov</a>

MA Fish & Game	Wayne MacCallum	Director of Wildlife	617-626-1590	<a href="mailto:Wayne.maccallum@state.ma.us">Wayne.maccallum@state.ma.us</a>
MA Fish & Game	H. Heusman	Biologist	508-792-7270	<a href="mailto:hheusman@state.ma.us">hheusman@state.ma.us</a>
MA USDA Wildlife Services	Monte Chandler	State Director (CT, MA, & RI)	413-253-2403	<a href="mailto:Monte.d.chandler@aphis.usda.gov">Monte.d.chandler@aphis.usda.gov</a>
MA Dept of Health	Mitt Romney	Governor	(617) 624-6000	

### **Massachusetts**

#### **Massachusetts Pandemic and Avian Flu Information**

Massachusetts Department of Agricultural Resources  
251 Causeway Street, Suite 500  
Boston, Massachusetts 02114-2151  
Phone: (617) 626-1700  
Fax: (617) 626-1850  
Web:

<http://www.mass.gov/agr/>

Division of Fisheries & Wildlife  
Massachusetts Department of Fisheries, Wildlife & Environmental Law Enforcement  
One Rabbit Hill Road  
Westborough MA 01581  
Phone: (508) 792-7270  
Fax: (508) 792-7275  
Web:  
<http://www.state.ma.us/dfwele/dfw>

Massachusetts Department of Public Health  
250 Washington Street, 2nd Floor  
Boston, MA 02108  
Phone: (617) 624-6000  
Fax: (617) 624-5206  
Web:  
<http://www.state.ma.us/dph/dphhome.htm>

When contacted by the general public about finding dead birds and/or reporting sick or dead birds should be referred to:

**1-866-4-USDA-WS**

### **(c.) Regulatory Compliance**

**i. SECTION 7:** If E/T species are involved or affected by any surveillance monitoring or disease outbreaks on the refuge section 7 consultations should be considered.

**ii. NEPA COMPLIANCE:** All nondestructive collection, inventory (including field, aerial and satellite surveying and mapping, studies, research, surveillance and

monitoring activities are categorically excluded (**Categorical Exclusion 516 DM 2 Appendix 1.5**). Research, inventory, and information collection activities directly related to the conservation of fish and wildlife resources which involve negligible animal mortality or habitat destruction, no introduction of contaminants, or no introduction of organism not indigenous to the affected ecosystem (**Categorical Exclusion 516 DM6, Appendix 1.4B.1**).

Consistent with relevant Policy [303AM 3.9A(1)], the actions contained in this DCP qualify as categorical exclusions for the purpose of NEPA compliance. They would not individually or cumulatively have a significant impact on the quality of the human environment and would not involve unresolved conflicts concerning alternative uses of available resources.

Also **NWRSAA of 1966**, as amended [16 U.S.C. 668dd (k)] Emergency Power: “notwithstanding any other provision of this Act, the Secretary may temporarily suspend, allow, or initiate any activity in the refuge in the System if the Secretary determines it is necessary to protect the health and safety of the public or any fish and wildlife population.” Also title 50 regulations, Section 25.21 Re: **Closing National Wildlife Refuges**, states, “ Once opened, all or any part of a national wildlife refuge may closed to public access and use in accordance with the provisions of 25.31, without advance notice, in the event of an emergency endangering life or property or to protect the resources of the area.”

**iii. COMPATIBILITY:** For purposes of refuge compatibility and consistent with this plan, all person/organizations accessing the refuge for HPAI surveillance or response would be considered USFWS authorized agents helping us to conduct refuge management activities and, therefore, no written compatibility determination would be required.

## **(5.) DATA RECORDING**

All surveillance and response data entry and reporting used by refuge staff will consist of the NWHC standardized forms and information requirements (all found in appendices of this DCP). For on-line data recording of appropriate surveillance data will be done on <http://wildlifedisease.nh.gov/ai/>. Data records of dying wild birds and/or dead bird pick-ups will adhere to all NWHC protocols and standardized operating procedures.

All reports and data form copies will be retained as part of the Refuge file records and appropriate distribution of required information will be made to the regional office, USFWS Wildlife Veterinarian, USGS-NWHC, cooperating Massachusetts Wildlife Management sections, other federal agencies and any other entities deemed appropriate in the finalized national USFWS disease contingency plan. Any additional specific data recording, reporting and archiving protocols for HPAI surveillance and response activities developed in the final USFWS national document will be incorporated in refuge data recording procedures in this section.

## GLOSSARY OF TERMS USED IN THIS DCP

- 1) **Endemic:** a disease that commonly is present within a population or geographical area.
- 2) **Enzootic:** an animal disease that commonly is present within a population or geographical area.
- 3) **Epidemiology:** the scientific study of the causes, distributions, and control of disease in populations.
- 4) **Epizootic:** a disease affecting a greater number of animals than normal; typically, occurrences involving many animals in the same region at the same time.
- 5) **Pandemic:** an outbreak of a disease or illness that spreads quickly among individuals that spreads over a wide area, such as an entire country or continent, at the same time.
- 6) **Virus Shedding:** discharge of virus from body openings by way of exudates, excrement, or other body wastes or discharges.
- 7) **HEDDS:** HPAI Early Disease Detection System has been developed by USGS to manage large animal and specimen collection of data taken by many groups and individuals, and analyzed by multiple laboratories. It provides a secure, accessible platform for the generation of reports, graphs and maps, and can also be used for spatial modeling. HEDDS is the system that will hold data for the **five identified surveillance strategies** in the national interagency surveillance plan. For more information contact:

WDIN Node Manager – Robert Worrest – USGS Biological Information Office  
NBII Program (703) 648-4074 [rworrest@usgs.gov](mailto:rworrest@usgs.gov)

## REFERENCES

- (CDC) – Center for Disease Control Guidelines for PPE during H5N1-HPAI Surveillance and Mortality Events 2006. (<http://www.cdc.gov/flu/avian/professional/protect.htm>).
- (CIDRAP) – Center for Infectious Disease Research and Policy. University of Minnesota 2006. (<http://www.cidrap.umn.edu/cidrap/content/influenza/avianflu/biofacts/>)
- Davies, C. et al. 2006. Surveillance for Early Detection of Highly Pathogenic Avian Influenza H5N1 in Wild Migratory Birds: A Strategy for the Atlantic Flyway, Migratory Bird Technical Section/Ad HOC AI Community, 20 pages.



Friend and Franson (eds) 1999. Field Manual of Wildlife Disease: General Field Procedures and Diseases of Bird (Chapter 4 – “Disease Control Operations,” pp 19-47 and Chapter 22 – “Avian Influenza,” pp 181-186). Biological Resources Division – INFORMATION AND TECHNOLOGY REPORT # 1999-001, USGS.

NWHC Guidelines for Handling Wild Birds. 2006. ([http://www.nwhc.gov/publications/Wildlife\\_health\\_bulletns/WHB\\_05\\_03.jsp](http://www.nwhc.gov/publications/Wildlife_health_bulletns/WHB_05_03.jsp)), USGS.

WHO. 2006. Epidemic and pandemic alert and response (EPR). ([http://www.who.int/csr/disease/avian\\_influenza](http://www.who.int/csr/disease/avian_influenza)).

United States Interagency Strategic Plan (USISP) 2006. An Early Detection System for Highly Pathogenic H5N1 Avian Influenza in Wild Migratory Birds, (final draft 03/14/06), Department of Interior, Washington, D. C.

## **Attachment 1**

### **Employee Safety and Health for Avian Influenza Surveillance and Control Activities:**

This document provides guidance for protecting Department of the Interior (DOI) employees involved in surveillance activities and/or in response to an outbreak of avian influenza among wildlife in the United States. Activities that could result in exposure to avian influenza-infected birds or wildlife include trapping and handling live birds, euthanasia, carcass collection and disposal, and cleaning and disinfection of equipment, vehicles, and PPE. Its purpose is to clarify and consolidate what is currently in the various avian influenza plans concerning health and safety issues. The protective measures have been developed in collaboration with the Centers for Disease Control and Prevention and are consistent with those recommendations from the Occupational Safety and Health Administration.

The safety and health precautions including personal protective equipment, work practices, and personal hygiene practices depend on the circumstances and the nature of the task being performed. However, the table below describes general activities and the required protective measures to minimize exposure. We realize this doesn't cover all tasks that may be assigned to DOI personnel. Tasks not anticipated or covered in the following table should be evaluated based on a risk assessment methodology in conjunction with safety and health professionals.

These precautions are based on protecting individuals involved in the response to an outbreak of highly pathogenic avian influenza H5N1 from illness and the risk of viral reassortment (i.e., mixing of genes from human and avian viruses). The health risk to humans from low pathogenic avian influenza viruses is less well established, but is likely to be lower. Nonetheless, it is considered prudent to take all possible precautions to the extent feasible when individuals have contact with birds infected by any avian influenza virus as part of control and eradication activities. Because of this, precautions should be taken even for birds appearing healthy.

The risk and consequent recommendations are dependent on the suspected presence of the virus in the wildlife being handled. For example if the virus has not been detected in birds in North America and we have no reason to suspect birds from specific migration routes would be infected at this time, then normal protective measures will suffice. However, if a suspect species of birds is expected to migrate into an area directly from areas where the virus is known to occur, even though the virus has not yet been detected, additional protective measures should be taken.

Unvaccinated workers should receive the current season's influenza vaccine to reduce the possibility of dual infection with avian and human influenza viruses. There is a small possibility that dual infection could occur and result in re-assortment.

According to CDC guidance, employees in direct contact with H5N1 infected birds or contaminated surfaces as listed below should receive an influenza antiviral drug daily. The choice of antiviral drug should be based on sensitivity testing when possible. In the

absence of sensitivity testing, a oseltamavir (tamiflu™) is the first choice since the likelihood is smaller that the virus will be resistant to this class of antiviral drugs than to amantadine or rimantadine.

ACTIVITY	CONDITIONS	DISCUSSION	PPE	WORK PRACTICE	ANTIVIRAL MEDS INDICATED I NOT INDICATED: NI
Handling apparently healthy birds	Avian influenza H5N1 not suspected in North America	No increase in avian influenza risk.	<ul style="list-style-type: none"> <li>•Latex, pvc, nitrile gloves</li> <li>•Eye protection</li> </ul>	Follow PPE and work practices for normal operations. Work in well-ventilated areas if working indoors. When working outdoors work upwind of animals, to the extent practical, to decrease the risk of inhaling aerosols such as dust, feathers, or dander.	NI
Handling sick birds	Avian influenza H5N1 not suspected in North America	No increase in avian influenza risk.	<ul style="list-style-type: none"> <li>•Latex, pvc, nitrile gloves</li> <li>•Goggles</li> <li>•NIOSH approved particulate respirator, N-95 or better.</li> <li>•Coveralls</li> <li>•Rubber boots or boot covers</li> </ul>	Use accepted precautions for working with any avian disease to protect employee and for disease containment to prevent or control transmission to other wildlife.	NI
Collecting single dead birds or multiple dead birds handled individually.	Regardless of presence of avian influenza H5N1.	Very low risk of airborne transmission of viral particles	<ul style="list-style-type: none"> <li>•Latex, pvc, vinyl gloves</li> </ul>	<p>Bag birds using technique to minimize contact and generation of airborne particulate material. Wash hands after handling animals. Dispose of bag and gloves appropriately.</p> <p>Keep hands away from mouth and face until thoroughly washed.</p>	NI
Small scale cleaning and disinfecting equipment known or suspected to be contaminated with avian	Avian influenza H5N1 suspected or confirmed	Low risk of aerosoling virus on particles or soiling clothing from contact with contaminated material. Work involves wiping down equipment.	<ul style="list-style-type: none"> <li>•Latex, pvc, nitrile gloves</li> <li>•Goggles</li> </ul>	<p>Surfaces should be cleaned with detergent and water and then sanitized.</p> <p>Useful sanitizing solutions include: 1% solution of household bleach [1.25 oz or about 8 teaspoons of bleach (5.25 % sodium hypochlorite) per gallon of water] for hard, non-porous surfaces. 5% solution of household bleach for porous</p>	NI
				<p>EPA-approved disinfectants.</p> <p>Keep hands away from mouth and face until thoroughly washed. Remove eye protection after hands have been washed and place in designated receptacle for subsequent cleaning and disinfection. Clean hands with soap and water a second time (or an alcohol-based hand gel when soap and water are not available) immediately after PPE is removed.</p>	
Large scale decon or cleaning operations involving dusty conditions or risk of aerosolizing contaminants.	Avian influenza H5N1 suspected or confirmed	Increase risk of aerosolized material or contact with contaminants on clothing.	<ul style="list-style-type: none"> <li>•Latex, pvc, nitrile gloves</li> <li>•Goggles</li> <li>•NIOSH approved particulate respirator, N-95 or better.</li> <li>•Coveralls</li> <li>•Rubber boots or boot covers</li> </ul>	<p>Avoid generating mists with water sprayers during equipment decon procedures (i.e. spraying out the bed of a contaminated truck, hosing off contaminated equipment, etc.)</p> <p>Use general cleaning and sanitizing procedures listed above.</p> <p>Keep hands away from mouth and face until thoroughly washed. Do not remove goggles or respirator until hands have been washed. Remove eye protection and place in designated receptacle for subsequent cleaning and disinfection. Remove and discard disposable N-95 as contaminated material. Clean hands with soap and water a second time (or an alcohol-based hand gel when soap and water are not available) immediately after PPE is removed.</p>	NI
Handling birds (sick or healthy) as part of the surveillance/ response effort	Avian influenza H5N1 suspected or confirmed	Possibility of dust generation and direct contact with fecal material or other bird related matter.	<ul style="list-style-type: none"> <li>•Latex, pvc, nitrile gloves</li> <li>•Goggles</li> <li>•NIOSH approved particulate respirator, N-95 or better.</li> <li>•Coveralls</li> <li>•Rubber boots or</li> </ul>	<p>Same hygiene practices as above.</p> <p>Work in well-ventilated areas if working indoors. When working outdoors work upwind of animals, to the extent practical, to decrease the risk of inhaling aerosols such as dust, feathers, or dander.</p>	I

Euthanizing, handling, and/or disposing of large volume of carcasses.	Avian influenza H5N1 suspected or confirmed	Possibility of dust generation and direct contact with fecal material or other bird related matter.	boot covers ♦Latex, pvc, nitrile gloves ♦Goggles ♦NIOSH approved particulate respirator, N-95 or better. ♦Coveralls ♦Rubber boots or boot covers	Same hygiene practices as above.  Use dust suppression techniques. Use workpractices to minimize direct contact with birds and fecal material.	I
Wildlife inspectors	Handling import shipments of wild birds (i.e. port of entry operations) Presence of avian influenza - unknown.	Possibility of dust generation and direct contract with birds or fecal material.	♦Latex, pvc, nitrile gloves ♦Goggles ♦NIOSH approved particulate respirator, N-95 or better. ♦Coveralls ♦Shoe covers	Following established practices described in wildlife inspector training manual.  Same hygiene practices as above.	NI

Use of respirators including N-95 filtering facepiece respirators requires implementing a Respiratory Protection Program as required by the Occupational Safety and Health Administration (OSHA). This includes training, fit-testing, and fit-checking to ensure appropriate respirator selection and use. To be effective, respirators must provide a proper sealing surface on the wearer's face. Detailed information on respiratory protection programs is provided at: [www.osha.gov/SLTC/etools/respiratory/index.html](http://www.osha.gov/SLTC/etools/respiratory/index.html) and [www.cdc.gov/niosh/topics/respirators/](http://www.cdc.gov/niosh/topics/respirators/).

**Strict adherence to hygiene and sanitation practices is required for all operations.**

- Do not eat, drink, or smoke, or any other activity which puts your hands in or near your eyes, nose, or mouth while handling animals and until you can wash your hands.
- Avoid unnecessary contact with animals or animal tissue.
- Educate employees about importance of hand washing in controlling disease transmission. Hands should be washed after contact with contaminated surfaces, after removing gloves, after sneezing, using the bathroom, handling garbage, contact with wildlife, soils and similar activities, and before preparing or eating food, smoking, drinking, applying cosmetics, lip balm, or lotions.

Proper hand washing:

1. First wet your hands and apply liquid or clean bar soap. Place the bar soap on a rack and allow it to drain.
2. Next rub you hands vigorously together and scrub all surfaces
3. Continue for 10-15 seconds. It is the soap combined with the scrubbing action that helps dislodge and remove germs.
4. Rinse well and dry your hands.
5. Alcohol-based sanitizing hand rubs or sanitizing cloths may be used as a

temporary solution when hand washing facilities are not available.  
Portable field hand washing facilities are easily rigged and transported.

### **Medical Evaluation**

For those in direct contact with live or dead wildlife or with contaminated materials from a source identified as a HPAI source:

- Medical evaluation is recommended for all exposed employees; this may include post-exposure prophylaxis (PEP) with antiviral drugs and medical surveillance of exposed workers.
- Instruct workers to be vigilant for the development of fever, respiratory symptoms, and/or conjunctivitis (i.e., eye infections) for 1 week after last exposure to avian influenza-infected or exposed birds or to potentially avian influenza-contaminated environmental surfaces.
- Individuals who become ill should seek medical care and, prior to arrival, notify their health care provider that they may have been exposed to avian influenza. In addition, employees should notify their health and safety representative.
- With the exception of visiting a health care provider, individuals who become ill should be advised to stay home until 24 hours after resolution of fever, unless an alternative diagnosis is established or diagnostic test results indicate the patient is not infected with influenza A virus.
- While at home, ill persons should practice good respiratory and hand hygiene to lower the risk of transmission of virus to others. For more information, visit CDC's "[Cover Your Cough](#)" website .

# Wildlife Health Bulletin 05-03

To: Natural Resource/Conservation Managers

From: Leslie Dierauf, Director, USGS National Wildlife Health Center

Title: Interim Guidelines for the Protection of Persons Handling Wild Birds With Reference to Highly Pathogenic Avian Influenza H5N1

Date: August 29, 2005

*These Guidelines have been developed in consultation with the Centers for Disease Control and Prevention. They are advisory in nature and intended to provide guidance for field biologists and others working with or handling wild birds with specific reference to highly pathogenic avian influenza. The guidance reflects information available as of August 2005 and may be updated as more information becomes available.*

## **Highly Pathogenic Avian Influenza H5N1**

**To date, Highly Pathogenic Avian Influenza A H5N1 has not been detected in humans, poultry or wild birds in North America and no data suggest that H5N1 should be suspected of being in North America or in wild birds migrating from Asia to North America this fall (2005).**

Avian influenza, or bird flu, is a virus typically found in wild birds, especially waterfowl and shorebirds. The virus is only found in a small number of birds in the wild, and generally does not cause clinical signs of disease. The virus is shed in fecal droppings, saliva and nasal discharges. Since 2003, a particularly virulent strain of this virus has emerged in Asia—the highly pathogenic avian influenza (HPAI) H5N1 virus. The HPAI H5N1 virus probably originated from domestic poultry in that region and is of concern because: 1) it poses a threat to domestic poultry, especially chickens; and 2) it has caused illness in 112 persons, including the deaths of at least 57 people as of August 2005. Most human cases are thought to have become infected with the virus through direct handling of infected poultry, consumption of uncooked poultry products, or contact with virus-contaminated surfaces/materials. However, to date, the risk of H5N1 transmission to people through direct contact with infected poultry remains very low. Probable, limited person-to-person transmission of H5N1 viruses in a small number of cases has been reported.

There are an increasing number of reports that HPAI H5N1 is infecting and causing death in wild birds, including some migratory species. These events and the associated spread of the H5N1 virus to new geographical areas in Asia have created concerns and questions about the possibility that the H5N1 virus could be carried into North America in migratory birds.

These Guidelines provide advice about practices and precautions people should exercise to mitigate the risk of HPAI H5N1 viral infection based on the level of exposure to wild birds. Because situations can change quickly, we have included recommendations for handling wild birds in the event that HPAI H5N1 is detected. It is important to check with your respective public health, animal health, and natural resource agencies for up-to-date information on HPAI H5N1.

There is no known case where H5N1 has been transmitted from wild birds to humans. However, even apparently healthy wild birds can be infected with microorganisms other than HPAI, some of which are currently of more concern to human health in North America than HPAI H5N1.

## **Recommendations:**

Thoroughly washing hands with soap and water (or with alcohol-based hand products if the hands are not visibly soiled) is a very effective method for inactivating influenza viruses, including HPAI. These viruses are also inactivated with many common disinfectants such as detergents, 10% household bleach, alcohol or other commercial disinfectants. The virus is more difficult to inactivate in organic material such as feces or soil.



The General Public should, as a general rule, observe wildlife, including wild birds, from a distance. This protects you from possible exposure to pathogens and minimizes disturbance to the animal.

- Avoid touching wildlife. If there is contact with wildlife do not rub eyes, eat, drink, or smoke before washing hands with soap and water as described above.
- Do not pick up diseased or dead wildlife. Contact your state, tribal or federal natural resource agency if a sick or dead animal is found.

Hunters should follow routine precautions when handling game.

- Do not handle or eat sick game.
- Wear rubber or disposable latex gloves while handling and cleaning game, wash hands as described above, and thoroughly clean knives, equipment and surfaces that come in contact with game.
- Do not eat, drink, or smoke while handling animals.
- All game should be thoroughly cooked (well done or 160° F). Additional information can be found at:  
[www.who.int/entity/foodsafety/fs\\_management/No\\_02\\_Avianinfluenza\\_Dec04\\_en.pdf](http://www.who.int/entity/foodsafety/fs_management/No_02_Avianinfluenza_Dec04_en.pdf).

Field Biologists handling apparently healthy wild birds in areas where HPAI H5N1 is not suspected should work in well-ventilated areas if working indoors. When working outdoors work upwind of animals, to the extent practical, to decrease the risk of inhaling aerosols such as dust, feathers, or dander.

- When possible, wear rubber or latex gloves that can be disinfected or discarded and protective eyewear or a face shield while handling animals.
- Wash hands often as described above, and disinfect work surfaces and equipment between sites.
- Do not eat, drink, or smoke while handling animals.

Field Biologists handling sick or dead birds associated with a mortality event should:

- Follow the recommendations above and at a minimum wear protective clothing, including coveralls, rubber boots, latex or rubber gloves that can be disinfected or discarded.
- Minimize exposure to mucosal membranes by wearing protective eyewear (goggles) and a particulate surgical mask (NIOSH N95 respirator/mask is preferable).
- Decontaminate work areas and properly dispose of potentially infectious material including carcasses. For additional Information see the USGS Field Guide to Wildlife Diseases:  
[http://www.nwhc.usgs.gov/pub\\_metadata/field\\_manual/chapter\\_4.pdf](http://www.nwhc.usgs.gov/pub_metadata/field_manual/chapter_4.pdf)
- Do not eat, drink, or smoke while handling animals.

Recommendations if HPAI is detected in North America

Field Biologists working with wild birds in areas where HPAI H5N1 has been detected, particularly during disease control operations, should consult with a health care provider and follow the latest guidelines from CDC and the WHO for prophylactic medications



and precautions for persons involved in avian influenza disease control:

[http://www.who.int/entity/csr/disease/avian\\_influenza/guidelines/Avian%20Influenza.pdf](http://www.who.int/entity/csr/disease/avian_influenza/guidelines/Avian%20Influenza.pdf)

<http://www.cdc.gov/flu/avian/professional/protect-guid.htm>

- Follow the recommendations above and the basic guidelines for infection control, including how to put on and use, remove, disinfect or dispose of personal protective equipment and clothing.
- Wash hands frequently and disinfect exposed surfaces and field equipment between work sites.
- Do not eat, drink, or smoke while handling animals.
- Wear coveralls, gloves, shoe covers, or boots that can be disinfected or discarded, a respirator (NIOSH N95 respirator/mask is preferable) and protective eyewear (goggles).
- Monitor your health for clinical signs of influenza infection during and for one week after your last exposure to potentially HPAI virus-infected or exposed birds.
- Contact your healthcare provider if you develop fever, flu-like symptoms or conjunctivitis (eye inflammation). Inform them prior to arrival that you have potentially been exposed to HPAI.

Additional information about HPAI H5N1 can be found at the following Web links:

USGS National Wildlife Health Center:

[http://www.nwhc.usgs.gov/research/avian\\_influenza/avian\\_influenza.html](http://www.nwhc.usgs.gov/research/avian_influenza/avian_influenza.html)

Centers for Disease Control and Prevention: <http://www.cdc.gov/flu/avian/index.htm>

## **Instructions for Collection and Shipment of Avian Carcasses for Diagnostic Evaluation**

The following are general guidelines for collecting and shipping wildlife carcasses to veterinary diagnostic labs to insure adequate and well preserved specimens. Field biologists should contact the specific laboratory that they will be working with well in advance of any specimen collection and shipping to receive specific instruction for specimen submissions to that lab. Labs should always be notified ahead of time when a shipment is being made to their facility. Once you have determined what equipment and supplies will be needed for specimen shipping, keep adequate numbers of shipping containers, frozen ice packs, shipping labels and packing materials available at all times. If you plan to collect animals while in the field, take along a cooler with ice packs to chill the carcasses.

1. More than one disease may be affecting the population simultaneously. Different species may have varying susceptibility to disease agents. Therefore, collect and ship specimens representative of all species and geographic areas affected.

Obtain good specimens for necropsy. Carcasses that are decomposed or scavenged are unacceptable. If the carcass has an odor, is soft and mushy, has skin discoloration, feathers or skin that easily rubs off, or has maggots present, it is too decomposed for testing.

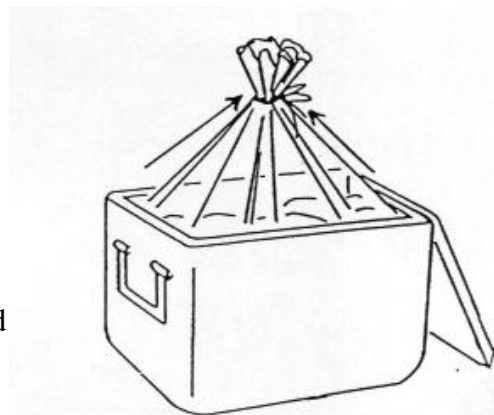
2. Collect animals under the assumption that an infectious disease or toxic substance is involved and other animals or humans may be at risk. Remember to protect yourself as some of these diseases and toxins are hazardous to humans. Guidelines for personal protection against disease exposure for individuals working with sick or dead wild animals can be obtained from the USGS National Wildlife Health Center, the Centers for Disease Control and Prevention, and OSHA websites.

Always wear latex or nitrile gloves when picking up sick or dead animals. If you are dealing with a significant number of dead animals, or you suspect the presence of a zoonotic disease agent, additional protective equipment including coveralls, eye protection and N95 respiratory protection should be used.

Attach a leg tag to each animal with the following information in pencil/waterproof ink:

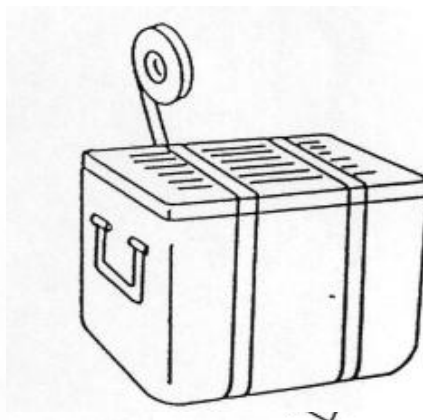
- species
- date collected
- location (state, county, location name, and latitude/longitude if available)
- found dead or euthanized
- collector (name/address/phone)
- additional history or comments on back of tag

Place each animal in a plastic bag, tie shut, then place inside a second bag and tie shut. This system of double bagging prevents cross-contamination of individual specimens and leaking shipping containers that can contaminate vehicle surfaces and handlers during transportation. Contact the diagnostic lab for guidance in assistance with

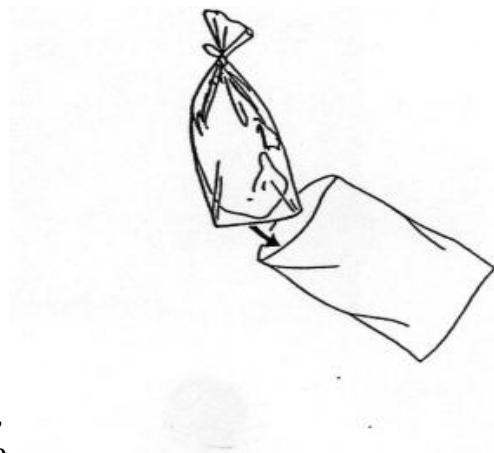


collecting samples from animals that are too large to ship.

3. Ship animals in a sturdy hard sided plastic cooler. These coolers can be disinfected and returned to you if a pre-paid shipping label or commercial shipping company account number is provided to the diagnostic lab. Be sure to provide a street address for return of the cooler.



Line the shipping cooler with a large plastic bag and pack the individually bagged animal(s) in the cooler with enough blue ice to keep carcasses cold. Disperse blue ice packs among the carcasses so that all carcasses are kept chilled. If you are shipping blood tubes, culture tubes, or other specimen containers along with the carcasses, these specimens should be placed within a sturdy cardboard or plastic box or screw cap container with padding material to prevent breakage. That container should be placed next to blue ice packs within the large cooler. Do not use bagged wet ice for shipments in order to avoid fluid leakage during shipment. Do not use dry ice unless instructed to do so by the diagnostic lab. Place crumpled newspaper or similar absorbent material in the cooler with the bagged carcasses to fill unused space, hold the ice in contact with carcasses, provide insulation, and absorb any liquids. Tape the cooler shut with sturdy strapping tape.



Place a detailed history of the animal and circumstances associated with the mortality event in a paper envelope or a plastic sleeve and tape it to the outside of the cooler. A copy of this history should be faxed or e-mailed to the diagnostic lab at the time of shipment. A standard wildlife specimen history form can be found on the last page of these instructions.

4. Prior to shipping contact the diagnostic lab to inform them of the type and number of specimens being shipped. Ship specimens for next day delivery (overnight service) from Monday through Wednesday to guarantee arrival at the diagnostic lab before the weekend. If specimens are fresh and need to be shipped on Thursday or Friday contact the diagnostic lab to make special arrangements for receipt of specimens.

Freezing and thawing can make isolation of some pathogens difficult and damage tissues needed for microscopic examination. Diagnostic labs prefer unfrozen specimens if they can be sent within 24 – 48 hours of collection or death. The diagnostic lab can provide guidance on when or if to freeze samples on a case-by-case basis. If you are in the field and cannot call or ship within 24-48 hours, freeze the animal(s).

5. Prior to shipping contact the commercial shipping company to obtain guidelines for shipping diagnostic or biological specimens. Label coolers with clear, legible labels including the diagnostic lab name, street address, and telephone number. In addition to the mailing address, attach a label reading “**DIAGNOSTIC SPECIMENS –WILDLIFE**” to the side of the cooler. If dry ice was used in the shipment a standard dry ice warning label will be required. These can be obtained from the shipping company. Please make note of the tracking number in case packages are delayed.